Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

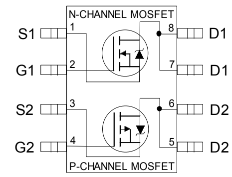
We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Features

- Advanced Planar Technology
- Low On-Resistance
- Logic Level Gate Drive
- Dual N and P Channel MOSFET
- Dynamic dv/dt Rating
- 150°C Operating Temperature
- Fast Switching
- Full Avalanche Rated
- Repetitive Avalanche Allowed up to Tjmax
- Lead-Free, RoHS Compliant
- Automotive Qualified *



Top View

	N-CH	P-CH
V_{DSS}	30V	-30V
$R_{DS(on)}$ max.	0.10Ω	0.25Ω
I_D	3.5A	-2.3A


SO-8
AUIRF9952Q

G	D	S
Gate	Drain	Source

Description

Specifically designed for Automotive applications, this cellular design of HEXFET® Power MOSFETs utilizes the latest processing techniques to achieve low on-resistance per silicon area. This benefit combined with the fast switching speed and ruggedized device design that HEXFET power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in Automotive and a wide variety of other applications.

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
AUIRF952Q	SO-8	Tape and Reel	4000	AUIRF9952QTR

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only; and functional operation of the device at these or any other condition beyond those indicated in the specifications is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions. Ambient temperature (TA) is 25°C, unless otherwise specified.

Symbol	Parameter	Max.		Units
		N-Channel	P-Channel	
I_D @ T_A = 25°C	10 Sec. Pulsed Drain Current, V_{GS} @ 10V	3.5	-2.3	A
I_D @ T_A = 70°C	Continuous Drain Current, V_{GS} @ 10V	2.8	-1.8	
I_{DM}	Pulsed Drain Current ①	16	-10	
P_D @T_A = 25°C	Maximum Power Dissipation	2.0		W
P_D @T_A = 70°C	Maximum Power Dissipation	1.3		
	Linear Derating Factor	0.016		W/°C
V_{GS}	Gate-to-Source Voltage	± 20		V
E_{AS}	Single Pulse Avalanche Energy (Thermally Limited) ③	44	57	mJ
I_{AR}	Avalanche Current ①	2.0	-1.3	A
E_{AR}	Repetitive Avalanche Energy ①	0.25		mJ
dv/dt	Peak Diode Recovery dv/dt ②	5.0	-5.0	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to + 150		°C

Thermal Resistance

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient (PCB Mount, steady state) ⑤	——	62.5	°C/W

HEXFET® is a registered trademark of Infineon.
*Qualification standards can be found at www.infineon.com

Static @ T_J = 25°C (unless otherwise specified)

	Parameter		Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	N-Ch	30	——	——	V	V_{GS} = 0V, I_D = 250µA
		P-Ch	-30	——	——		V_{GS} = 0V, I_D = -250µA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	N-Ch	——	0.015	——	V/°C	Reference to 25°C, I_D = 1mA
		P-Ch	——	-0.015	——		Reference to 25°C, I_D = -1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	N-Ch	——	0.08	0.10	Ω	V_{GS} = 10V, I_D = 2.2A ④
			——	0.12	0.15		V_{GS} = 4.5V, I_D = 1.0A ④
		P-Ch	——	0.165	0.250		V_{GS} = -10V, I_D = -1.0A ④
			——	0.290	0.400		V_{GS} = -4.5V, I_D = -0.5A ④
$V_{GS(th)}$	Gate Threshold Voltage	N-Ch	1.0	——	3.0	V	V_{DS} = V_{GS}, I_D = 250µA
		P-Ch	-1.0	——	-3.0		V_{DS} = V_{GS}, I_D = -250µA
gfs	Forward Trans conductance	N-Ch	——	12	——	S	V_{DS} = 15V, I_D = 3.5A
		P-Ch	——	2.4	——		V_{DS} = -15V, I_D = -2.3A
I_{DSS}	Drain-to-Source Leakage Current	N-Ch	——	——	2.0	µA	V_{DS} =24V, V_{GS} = 0V
		P-Ch	——	——	-2.0		V_{DS} = -24V,V_{GS} = 0V
		N-Ch	——	——	25		V_{DS} =24V, V_{GS} = 0V ,T_J = 125°C
		P-Ch	——	——	-25		V_{DS} = -24V,V_{GS} = 0V,T_J = 125°C
I_{GSS}	Gate-to-Source Forward Leakage	N-P	——	——	± 100	nA	V_{GS} = ± 20V
	Gate-to-Source Reverse Leakage	N-P	——	——	± 100		V_{GS} = ± 20V

Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter		Min.	Typ.	Max.	Units	Conditions
Q_g	Total Gate Charge	N-Ch	——	6.9	14	nC	N-Channel
		P-Ch	——	6.1	12		I_D = 1.8A, V_{DS} = 10V,V_{GS} = 10V
Q_{gs}	Gate-to-Source Charge	N-Ch	——	1.0	2.0		④
		P-Ch	——	1.7	3.4		P-Channel
Q_{gd}	Gate-to-Drain Charge	N-Ch	——	1.8	3.5		I_D = -2.3A,V_{DS} = -10V,V_{GS} = -10V
		P-Ch	——	1.1	2.2		
$t_{d(on)}$	Turn-On Delay Time	N-Ch	——	6.2	12	ns	N-Channel
		P-Ch	——	9.7	19		V_{DD} = 10V,I_D = 1.0A,R_G = 6.0Ω,
t_r	Rise Time	N-Ch	——	8.8	18		R_D = 10Ω
		P-Ch	——	14	28		④
$t_{d(off)}$	Turn-Off Delay Time	N-Ch	——	13	26		P-Channel
		P-Ch	——	20	40		V_{DD} = -10V,I_D = -1.0A,R_G = 6.0Ω,
t_f	Fall Time	N-Ch	——	3.0	6.0		R_D = 10Ω
		P-Ch	——	6.9	14		
C_{iss}	Input Capacitance	N-Ch	——	190	——	pF	N-Channel
		P-Ch	——	190	——		V_{GS} = 0V,V_{DS} = 15V,f = 1.0MHz
C_{oss}	Output Capacitance	N-Ch	——	120	——		
		P-Ch	——	110	——		P-Channel
C_{rss}	Reverse Transfer Capacitance	N-Ch	——	61	——		V_{GS} = 0V,V_{DS} = -15V,f = 1.0MHz
		P-Ch	——	54	——		

Diode Characteristics

	Parameter		Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	N-Ch	——	——	1.7	A	
		P-Ch	——	——	-1.3		
I_{SM}	Pulsed Source Current (Body Diode) ①	N-Ch	——	——	16		
		P-Ch	——	——	-16		
V_{SD}	Diode Forward Voltage	N-Ch	——	0.82	1.2	V	T_J = 25°C,I_S = 1.25A,V_{GS} = 0V ④
		P-Ch	——	-0.82	-1.2		T_J = 25°C,I_S = -1.25A,V_{GS} = 0V ④
t_{rr}	Reverse Recovery Time	N-Ch	——	27	53	ns	N-Channel
		P-Ch	——	27	54		T_J = 25°C ,I_F = 1.25A, di/dt = 100A/µs
Q_{rr}	Reverse Recovery Charge	N-Ch	——	28	57	nC	P-Channel ④
		P-Ch	——	31	62		T_J = 25°C,I_F = -1.25A, di/dt = 100A/µs
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)					

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig.23)

② N-Channel $I_{SD} \leq 2.0A$, di/dt ≤ 100A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150°C$.
P-Channel $I_{SD} \leq -1.3A$, di/dt ≤ 84A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150°C$.

③ N-Channel Starting T_J = 25°C, L = 22mH R_G = 25Ω, I_{AS} = 2.0A.(See Figure 12)
P-Channel Starting T_J = 25°C, L = 67mH R_G = 25Ω, I_{AS} = -1.3A.

④ Pulse width ≤ 300µs; duty cycle ≤ 2%.

⑤ Surface mounted on FR-4 board , t ≤ 10sec.

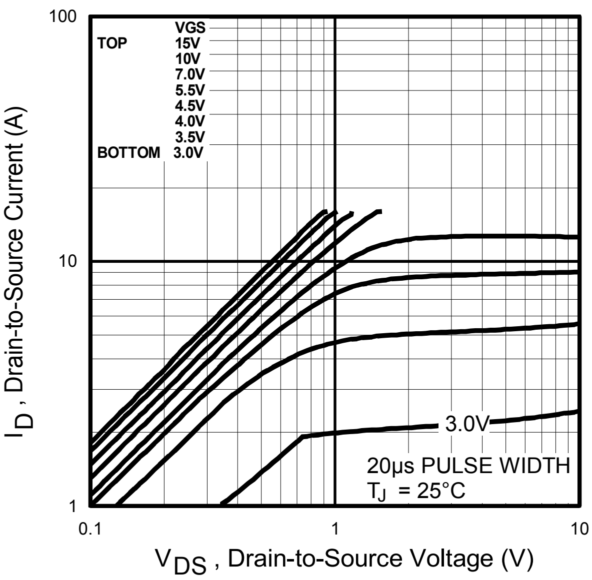


Fig. 1 Typical Output Characteristics

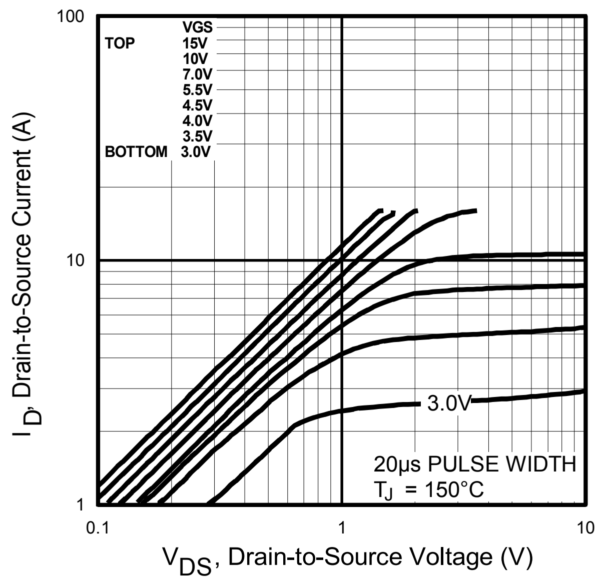


Fig. 2 Typical Output Characteristics

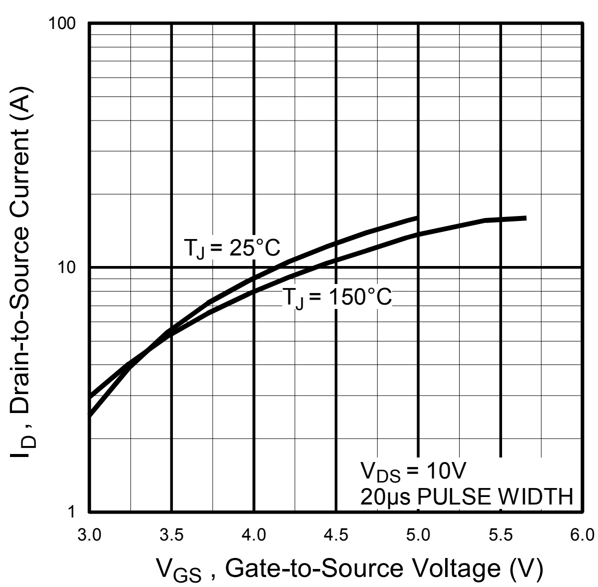


Fig. 3 Typical Transfer Characteristics

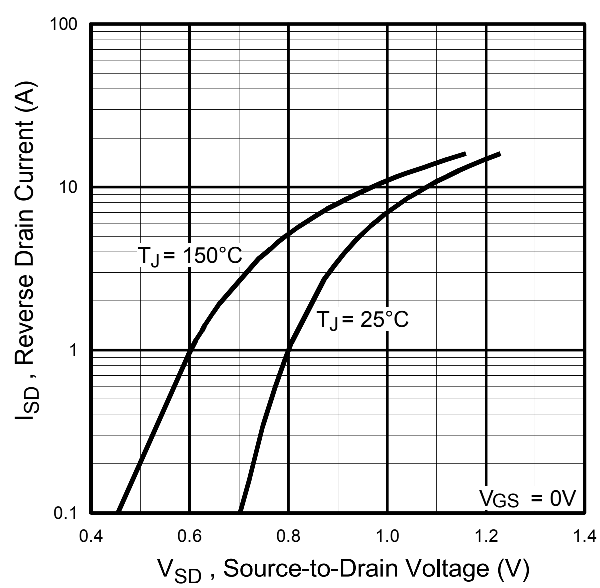


Fig. 4 Typical Source-Drain Diode Forward Voltage

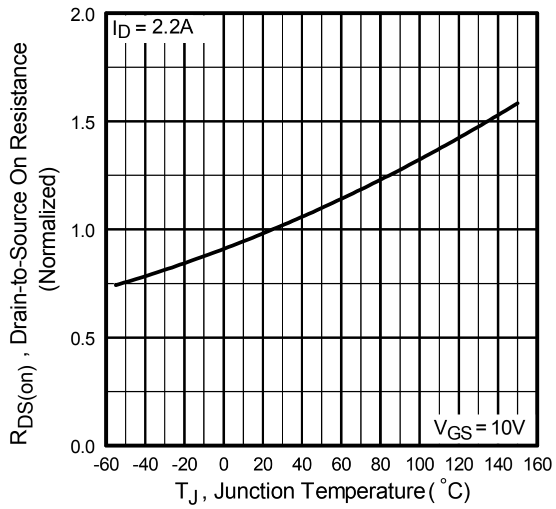


Fig 5. Normalized On-Resistance Vs. Temperature

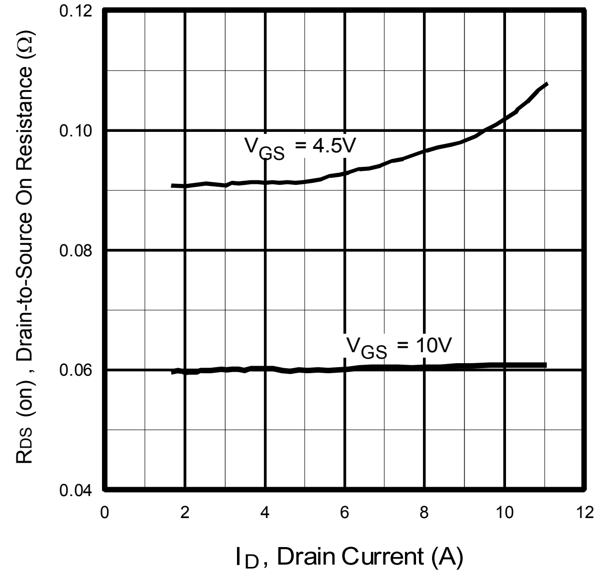


Fig 6. Typical On-Resistance Vs. Drain Current

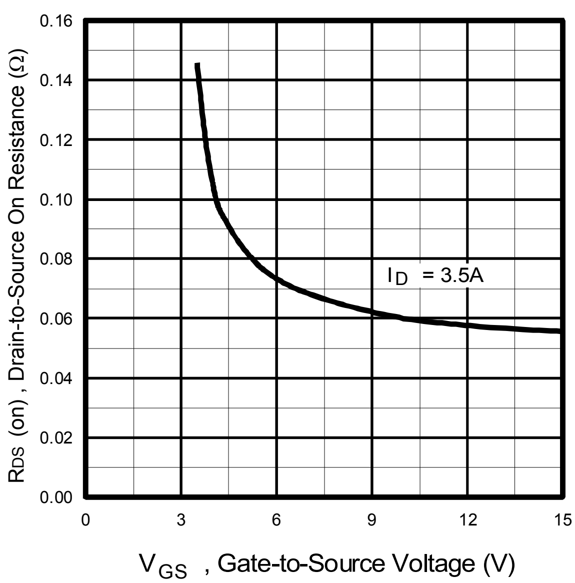


Fig. 7 Typical On-Resistance Vs. Gate Voltage

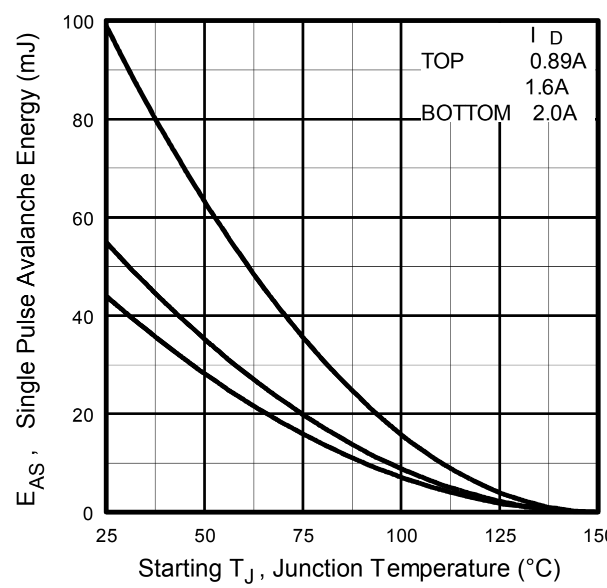


Fig 8. Maximum Avalanche Energy Vs. Drain Current

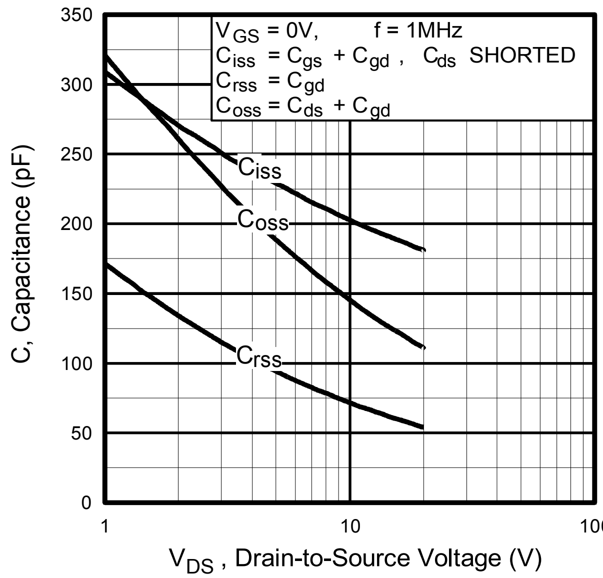


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

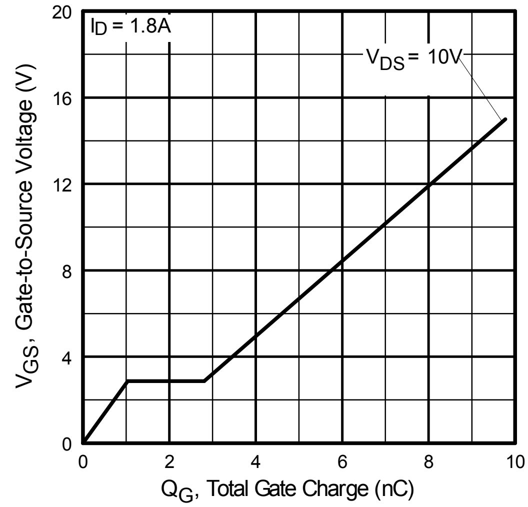


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

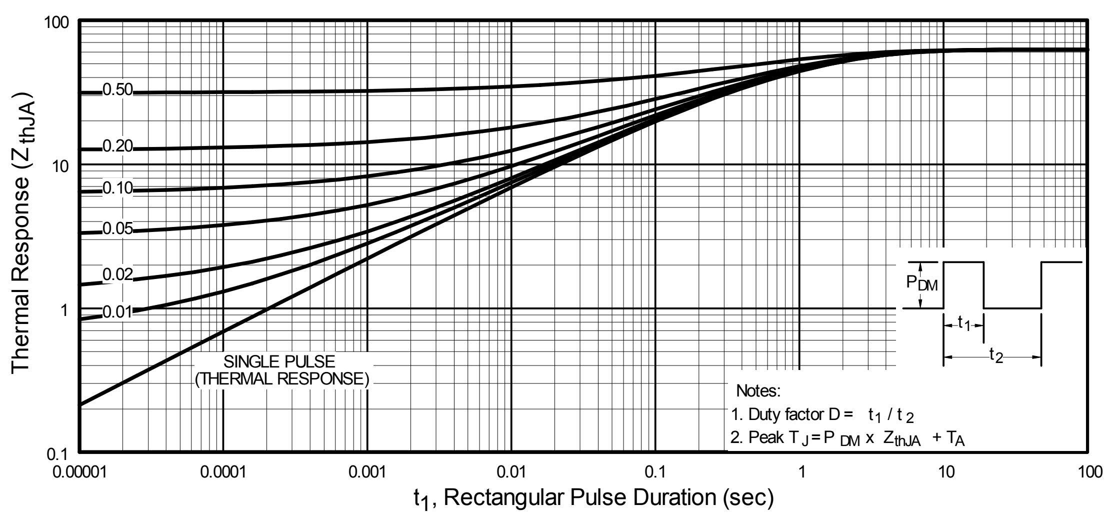


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

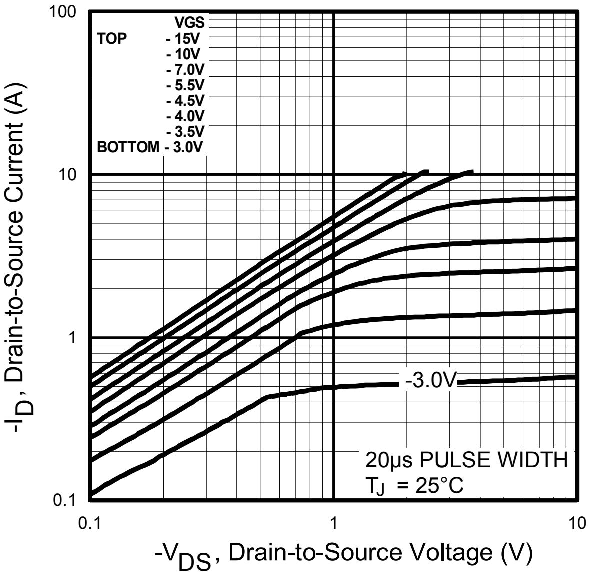


Fig. 12 Typical Output Characteristics

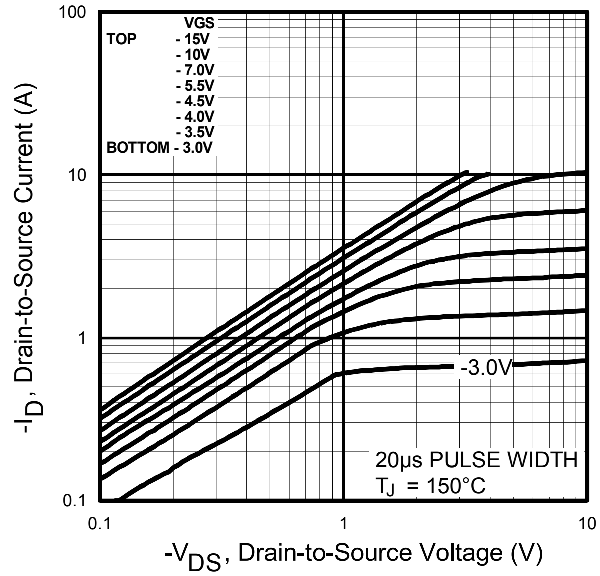


Fig. 13 Typical Output Characteristics

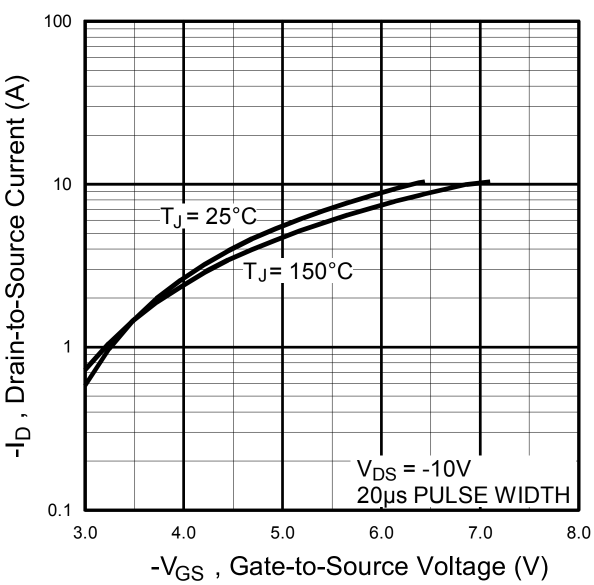


Fig. 14 Typical Transfer Characteristics

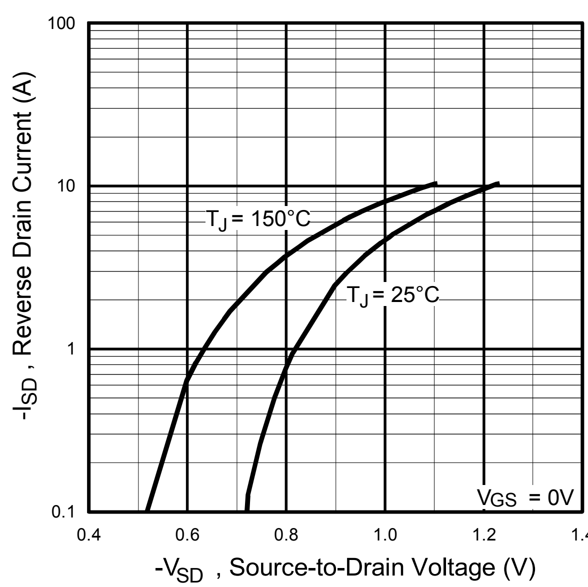


Fig. 15 Typical Source-Drain Diode Forward Voltage

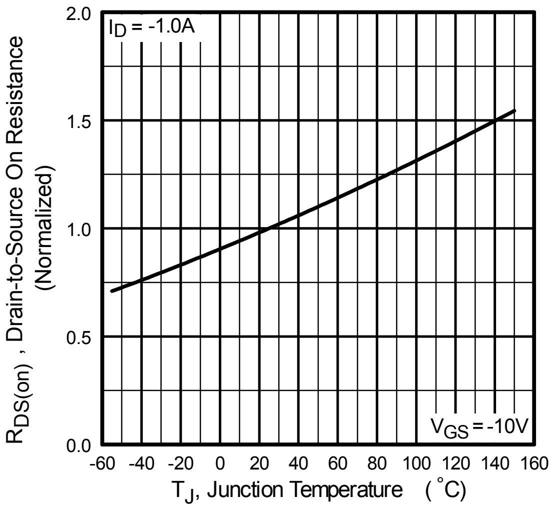


Fig 16. Normalized On-Resistance Vs. Temperature

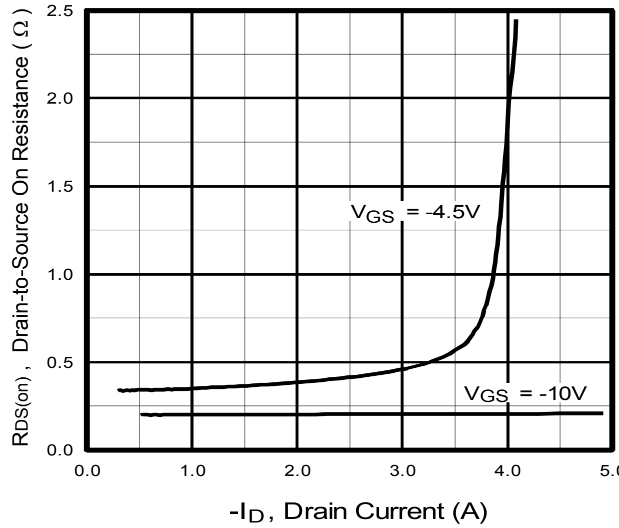


Fig 17. Typical On-Resistance Vs. Drain Current

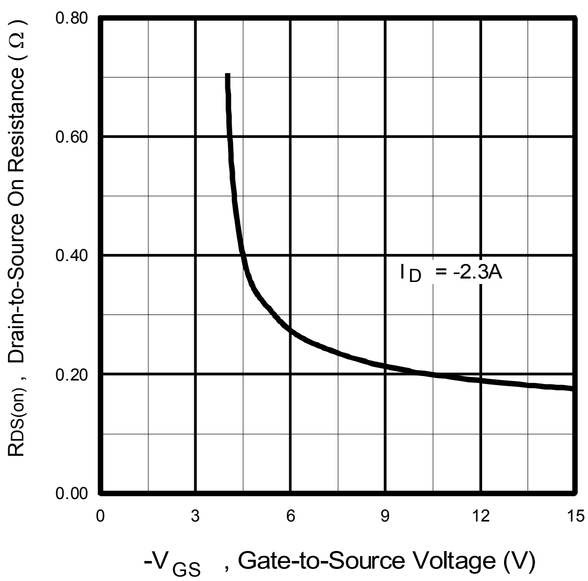


Fig. 18 Typical On-Resistance Vs. Gate Voltage

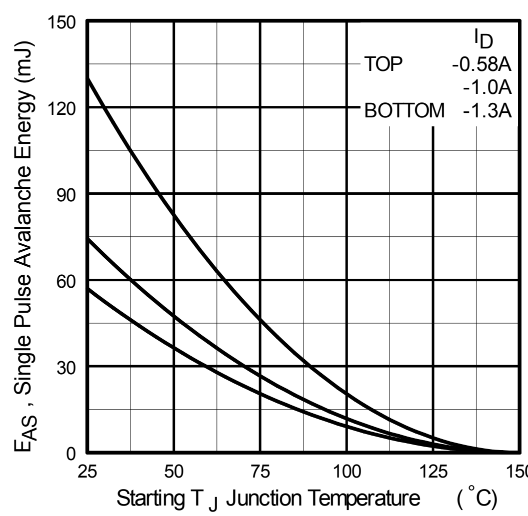


Fig 19. Maximum Avalanche Energy Vs. Drain Current

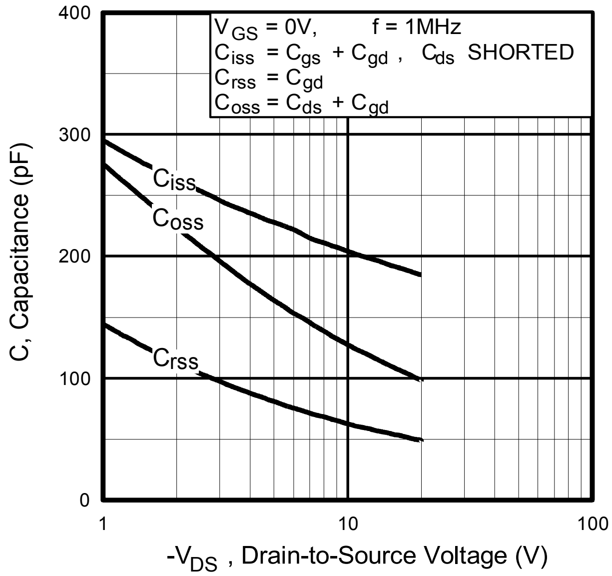


Fig 20. Typical Capacitance Vs. Drain-to-Source Voltage

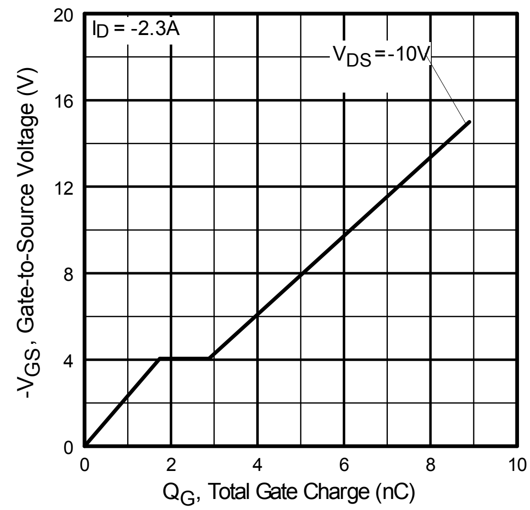


Fig 21. Typical Gate Charge Vs. Gate-to-Source Voltage

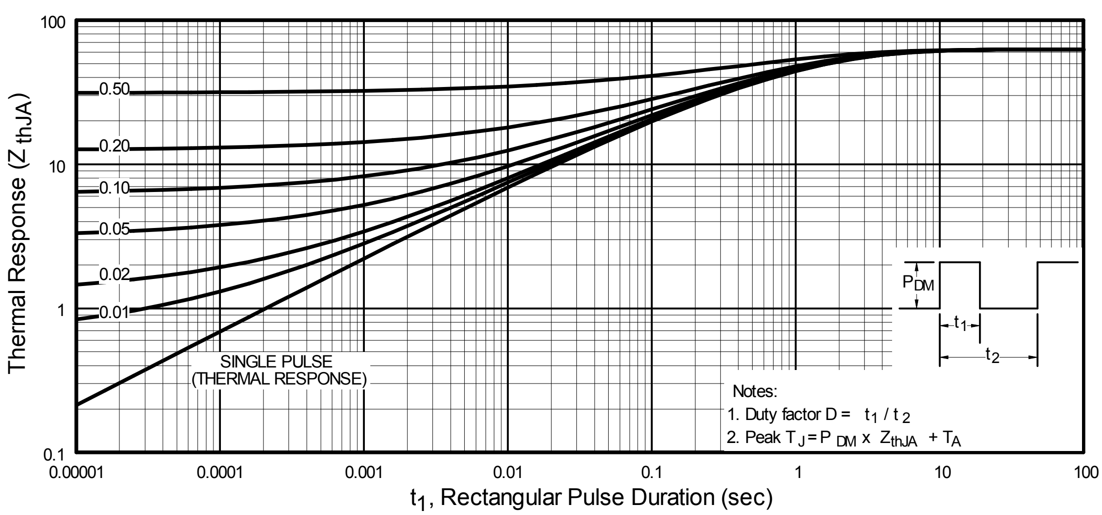
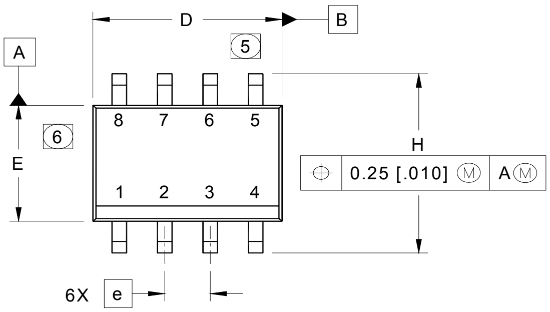
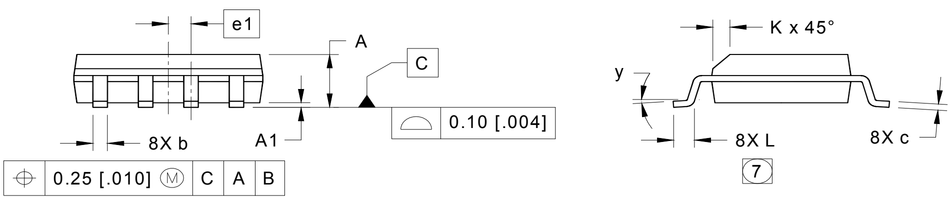


Fig 22. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

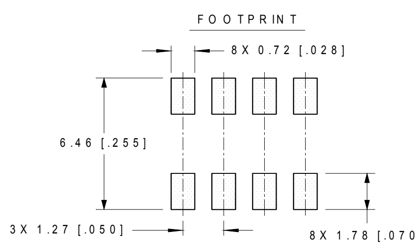
SO-8 Package Outline (Dimensions are shown in millimeters (inches))



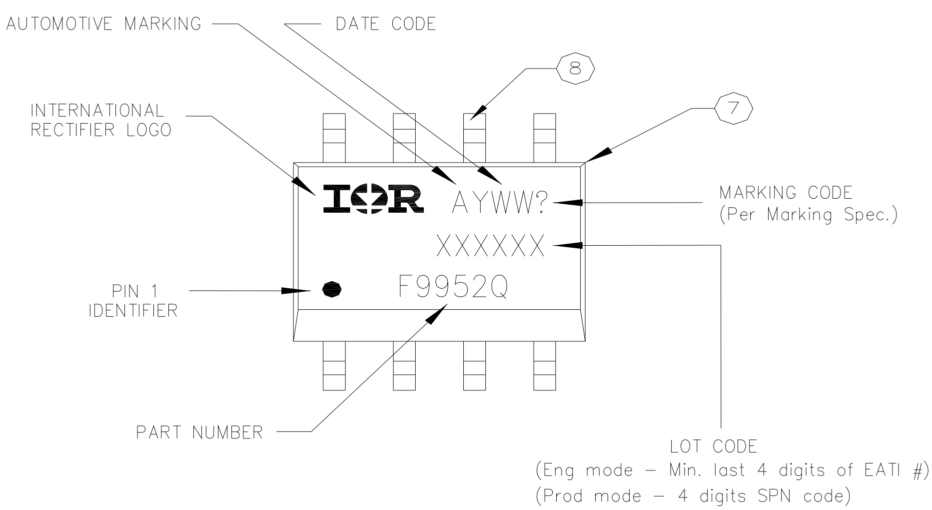
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.0532	.0688	1.35	1.75
A1	.0040	.0098	0.10	0.25
b	.013	.020	0.33	0.51
c	.0075	.0098	0.19	0.25
D	.189	.1968	4.80	5.00
E	.1497	.1574	3.80	4.00
e	.050 BASIC		1.27 BASIC	
e 1	.025 BASIC		0.635 BASIC	
H	.2284	.2440	5.80	6.20
K	.0099	.0196	0.25	0.50
L	.016	.050	0.40	1.27
y	0°	8°	0°	8°



NOTES:
1. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994.
2. CONTROLLING DIMENSION: MILLIMETER
3. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
4. OUTLINE CONFORMS TO JEDEC OUTLINE MS-012AA.
5. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.15 [.006].
6. DIMENSION DOES NOT INCLUDE MOLD PROTRUSIONS. MOLD PROTRUSIONS NOT TO EXCEED 0.25 [.010].
7. DIMENSION IS THE LENGTH OF LEAD FOR SOLDERING TO A SUBSTRATE.

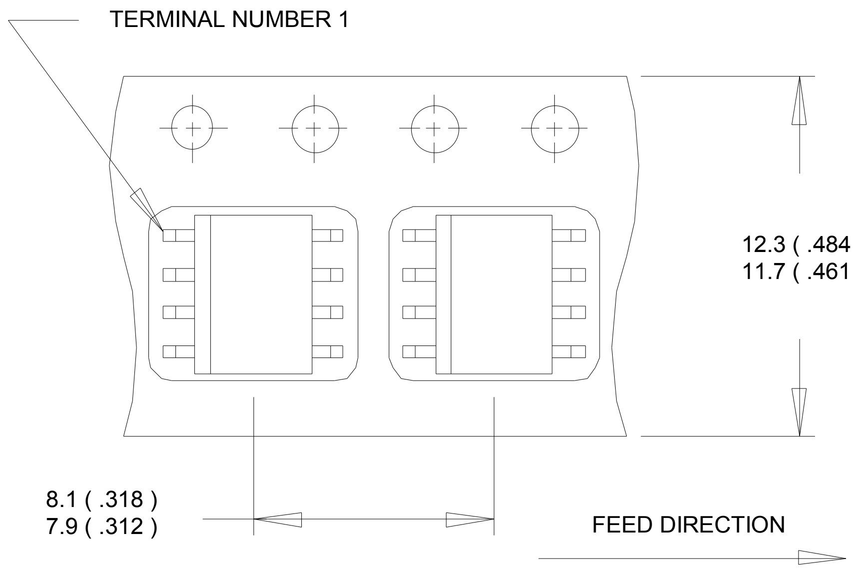


SO-8 Part Marking Information

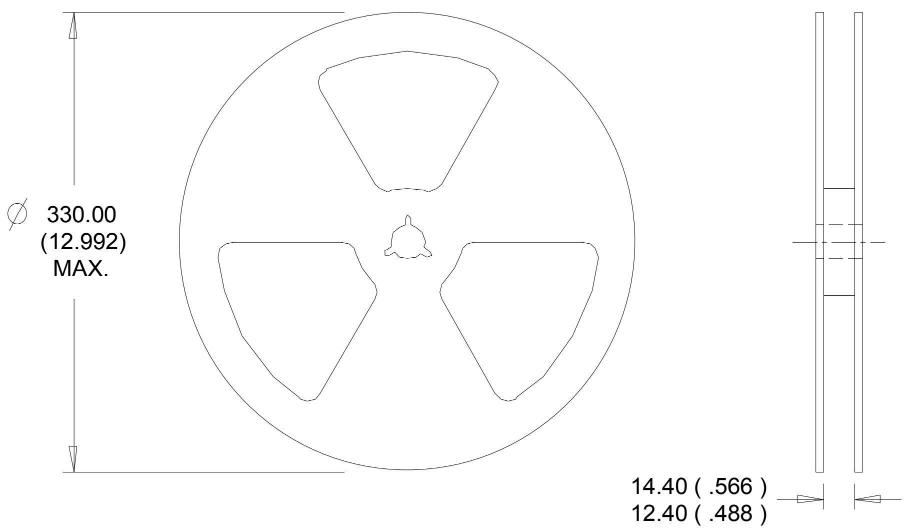


Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

SO-8 Tape and Reel (Dimensions are shown in millimeters (inches)



NOTES:
1. CONTROLLING DIMENSION : MILLIMETER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS(INCHES).
3. OUTLINE CONFORMS TO EIA-481 & EIA-541.



NOTES :
1. CONTROLLING DIMENSION : MILLIMETER.
2. OUTLINE CONFORMS TO EIA-481 & EIA-541.

Note: For the most current drawing please refer to IR website at http://www.irf.com/package/

Qualification Information

Qualification Level		Automotive (per AEC-Q101)	
		Comments: This part number(s) passed Automotive qualification. Infineon's Industrial and Consumer qualification level is granted by extension of the higher Automotive level.	
Moisture Sensitivity Level		SO-8	MSL1
ESD	Machine Model	N Ch: Class M1A (+/- 50V)† P Ch: Class M1A (+/- 50V)† AEC-Q101-002	
	Human Body Model	N Ch: Class H0 (+/- 150V)† P Ch: Class H0 (+/- 150V)† AEC-Q101-001	
	Charged Device Model	N Ch: Class C4 (+/- 1000V)† P Ch: Class C4 (+/- 1000V)† AEC-Q101-005	
RoHS Compliant		Yes	

† Highest passing voltage.

Revision History

Date	Comments
3/5/2014	• Added "Logic Level Gate Drive" bullet in the features section on page 1 • Updated data sheet with new IR corporate template
10/5/2015	• Updated datasheet with corporate template • Corrected ordering table on page 1.

Published by
Infineon Technologies AG
81726 München, Germany
© Infineon Technologies AG 2015
All Rights Reserved.

IMPORTANT NOTICE
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie"). With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.
In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.
The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.
For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).
WARNINGS
Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.
Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.